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CERTIFICATE

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I hereby certify that annexed is a true copy of the Provisional Specification as filed on 7 July 2003 with an application for Letters Patent number 526910 made by SIMWORKS INTERNATIONAL LIMITED.

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Neville Harris
Commissioner of Patents, Trade Marks and Designs



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PROVISIONAL SPECIFICATION

**SYSTEM AND METHOD FOR DETERMINING RELATIONSHIPS BETWEEN
USERS OF A NETWORKED SYSTEM**

We, **SIMWORKS INTERNATIONAL LIMITED**, a New Zealand company, of 72 Hunua Road, Papakura, Auckland, New Zealand do hereby declare this invention to be described in the following statement:

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**SYSTEM AND METHOD FOR DETERMINING RELATIONSHIPS BETWEEN USERS OF
A NETWORKED SYSTEM**

Field Of Invention

5 This invention relates to networked systems and, particularly but not solely, to systems or methods of determining, creating or maintaining relationships between users of networked systems.

Background

10 Digital technology offers a large number of networked systems which users can use to effect various forms of communication. An obvious example is the network which is commonly referred to as the Internet, and other examples are the wireless telephone networks and wireless data networks:

15. As networked systems and the tools that users' use to interface with such systems, for example, mobile telephones and mobile computing devices such as PDAs, become more prevalent, they are increasingly becoming the means by which people maintain social contact.

20 Growth in the use of and reliance on networked systems by individuals for communications and social contact means that, increasingly, individuals are almost continuously available to others in both their public and private lives. The increasing use of and reliance on such networked systems has also engendered an expectation amongst users that other users of such networked systems will be continuously contactable and a desire that communications between users be simple to establish and persistent in nature.

25 However, while the infrastructure underlying most networked systems today may be very reliable, impediments remain. One of the primary impediments in many networked systems is that there is only limited or no centralised management of users' network addresses or contact data. Without centralised management of such data there are limitations for example on how simply or quickly an individual can obtain another's network address (eg. Mobile phone number, email address etc), ascertain whether other individuals have a given individuals network address or keep a given individuals network address up to date.

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A system or method of identifying, managing, maintaining and expanding the relationships

between users of a networked system provides the basis for addressing such impediments, enabling the rapid creation of new relationships and maintenance of existing relationships between users of a networked system. Such a system or method would also provide a number of opportunities to operators of networked systems since improving the quality and quantity of relationships/connections between users has significant possibilities for increased use of the networked systems, or more efficient use, leading to increased operational revenues. Accordingly, there is a need for the determination, creation or maintenance of relationships between users of networked systems.

10 **Object**

It is an object of the present invention to provide a system or method for determining, creating or maintaining relationships between users of a networked system, or to provide a system or method which will at least provide the public with a useful alternative.

15 **SUMMARY OF THE INVENTION**

In one aspect the invention may broadly be said to consist in a method for determining one or more relationships between a plurality of users of a networked system, the method including the steps of:

20 populating a database with a unique user identifier for each of the plurality of users, further populating the database with connection data for each such user, searching the database for a predetermined user's unique user identifier to identify each user who has a connection to the predetermined user, and
25 storing the user identifiers located by the search to provide a group of stored user identifiers representative of one or more relationships between the predetermined user and one or more other users.

30 Typically the step of populating the database with connection data for each user will be accomplished by accessing the connection data on the user's network access device.

35 Preferably users may specify that certain user identifiers within their connection data not be accessible to other users of the networked system or be included in any processing of data undertaken by the present invention. User identifiers so specified are "Blacklisted".

Preferably a predetermined user may specify additional user identifiers that relate to the

predetermined user to be associated with the predetermined user's unique user identifier. Such additional user identifiers may relate to the given networked system or to any other networked system. It is not necessary for the networked system to which a given additional user identifier relates to be interconnected with the given networked system.

5 Preferably the record of a predetermined user's connection data in the database will be kept synchronised with the connection data stored in the predetermined user's network access device such that any changes to the connection data stored in the predetermined users network access device, whether initiated through interaction with the present
10 invention or independently by the predetermined user, will be communicated to the database ensuring that all processing of connection data undertaken by the present invention uses current and correct data.

15 Preferably, the step of searching the database in respect of a predetermined user may be performed for each user in the database.

Preferably, the stored user identifiers may be provided to the predetermined user.

20 Alternatively, the stored user identifiers may be compared with the connection data for the predetermined user, and the stored user identifiers which do not comprise part of the connection data for the predetermined user are provided to the predetermined user.

25 Preferably, the stored user identifiers may be compared with the connection data for the predetermined user, and the stored user identifiers which are not present in the predetermined user's connection data may be selected by the predetermined user for automatic insertion into the connection data in the predetermined user's network access device.

30 Alternatively, the stored user identifiers may be compared with the connection data for the predetermined user, and the connection data which do not comprise part of the stored user identifiers are provided to the predetermined user.

35 Preferably, the connection data of the predetermined user may be compared with the stored user identifiers, and the connection data which are not present in the stored user identifiers may be used to contact users who appear in the connection data but not in the stored user identifiers to invite them to include the predetermined user's user identifier in

their connection data.

Preferably the predetermined user may choose which if any of the users identified in the preceding paragraph are invited to include the predetermined user's user identifier in their connection data.

Preferably user's contacted in accordance with the preceding paragraph will have a network access device with an application present on it that will automatically insert the predetermined user's user identifier into the user's connection data.

10

Preferably, the stored user identifiers may be used to provide an indication of the popularity of a user of the networked system.

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Preferably, the aggregate connection data of users of a given networked system may be used to determine the popularity of users of an interconnected networked system with users of the given networked system. Such a determination may be provided to the operator of the given networked system or communicated to the users of the interconnected networked system.

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Preferably, if the user identifier for the predetermined user should change, the stored user identifiers may be used to contact users who have the predetermined user's user identifier, informing them of the change in the predetermined user's user identifier and providing them with the opportunity to update their record of the predetermined user's user identifier.

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Alternatively, if the user identifier for the predetermined user should change, the stored user identifiers may be used to send instructions to the network access device of users who have the predetermined user's user identifier to the effect that such device's record of the predetermined user's user identifier is updated automatically.

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Preferably, if a predetermined user permanently leaves the networked system for any reason the stored user identifiers may be used to contact users who have the predetermined user's user identifier in their connection data, informing them that the predetermined user's user identifier is no longer active and providing them with the opportunity to remove the predetermined user's user identifier from their connection data.

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Alternatively, if a predetermined user permanently leaves the networked system for any reason the stored user identifiers may be used to send instructions to the network access device of users who have the predetermined user's user identifier in their connection data, to the effect that such devices record of the predetermined user's user identifier is deleted from their connection data.

5 Preferably the step of populating the database for each user will determine if any of the user identifiers in the predetermined user's connection data are no longer active and provide the predetermined user with the opportunity to remove such inactive user
10 identifiers from the predetermined user's connection data.

15 Alternatively, the step of populating the database for each user will determine if any of the user identifiers in the predetermined user's connection data are no longer active and send instructions to the predetermined user's network access device to remove the inactive user identifier's from the predetermined user's connection data.

Typically users associate a name or identifier with each of the user identifiers that comprise the user's connection data.

20 Preferably users may associate a preferred name or identifier with their own user identifier.

25 Preferably the name or identifier associated with a predetermined user's user identifier in the connection data for each user comprised in the stored user identifiers may be compared with the predetermined user's preferred name or identifier and any of the users comprised in the stored user identifiers that do not use the predetermined user's preferred name or identifier in their connection data contacted to invite them to associate the predetermined user's preferred name or identifier with the predetermined user's user identifier in their connection data.

30 Preferably the predetermined user may choose which if any of the users identified in the preceding paragraph are invited to use the predetermined user's preferred name or identifier in their connection data.

35 Preferably users contacted in accordance with the two preceding paragraphs will have a network access device with an application present on it that will automatically change the

name or identifier associated with the predetermined user's user identifier in the user's connection data to be the name or identifier preferred by the predetermined user.

5 Preferably a user may request that the preferred name or identifier for any user identifier present in the user's connection data be provided to the user.

10 Preferably a user making a request in accordance with the preceding paragraph will have a network access device with an application present on it that will automatically change the name or identifier associated with a user identifier in the user's connection data to the preferred name or identifier provided to the user.

15 Preferably, the database is further populated with one or more characteristics of each user. Characteristics may include the name and occupation of each user.

20 Alternatively, the connection data of users in the database may be searched for a given user identifier to determine which users have a connection with the user associated with the given user identifier.

25 Preferably a predetermined user's connection data may be searched for at least one of the characteristics.

30 Preferably the connection data of each user comprised in the predetermined users connection data may be searched for at least one of the characteristics or for a given user identifier.

35 Preferably the results of any search for a given characteristic within a predetermined user's connection data or the results of any search for a given characteristic or a given user identifier within the connection data of each user comprised in the predetermined user's connection data may be provided to the predetermined user.

Preferably the stored user identifiers may be searched for at least one characteristic.

35 Preferably the connection data relating to each of the stored user identifiers may be

searched for at least one characteristic or for a given user identifier.

Preferably the results of any search for a given characteristic or a given user identifier within the stored user identifiers or the connection data of each stored user identifier may 5 be provided to the predetermined user.

Preferably users of a networked system may assign themselves or agree to be assigned to one or more groups. Such groups may represent clubs, families, workplaces or any other logical grouping of users. The user identifier and other characteristics of each 10 member of the group will be associated with each such group.

Preferably each group member will be notified of the name and user identifier of each member of the group. Such notification may be either automatic or upon the request of the group member. Such notification may occur either upon the formation of the group or 15 at any subsequent time.

Alternatively, the name and user identifier of each member of the group will be delivered to the network access device of each member of the group such that each group member will be given the option of including each or all of the other group members name and user 20 identities in the predetermined user's connection data, either manually or via the assistance of an application resident on the group member's network access device.

Alternatively, the name and user identifier of each member of the group will be delivered to the network access device of each member of the group such that the connection data for each group member is automatically updated to include the name and user identity of 25 each of the other members of the group.

Preferably each member of the group will be notified of the user identifier and name of any member that joins or leaves the group.

Alternatively, the name and user identifier of any member that joins or leaves the group 30 may be delivered to the network access device of each member of the group such that each group member will be given the option of adding or removing the user identifier and name of each such group member to/from the predetermined user's connection data, either manually or via the assistance of an application resident on the group member's 35 network access device.

Alternatively, the name and user identifier of each member that joins or leaves the group may be delivered to the network access device of each member of the group such that each group member's connection data is automatically updated to include/exclude the user identifier and name of each such joining/leaving group member.

5 Preferably each member of the group will be notified of any change in the user identifier of any member of the group.

10 Alternatively, the new user identifier of any group member may be delivered to the network access device of each group member such that each group member will be given the option to update the changed user identifier in the group member's connection data, either manually or via the assistance of an application resident on the group member's network access device.

15 Alternatively the new user identifier of any group member may be delivered to the network access device of each group member such that each group member's connection data is automatically updated to include any changes to the user identifier of any other member of the group.

20 Preferably the present invention may be interconnected with alternative means of obtaining user identifiers and associated preferred names or identifiers (if any).

25 Preferably a predetermined user may request that a user identifier and associated preferred name or identifier (if any) provided to them by an alternative means be communicated to the predetermined user's network access device.

30 Preferably the predetermined user's network access device will have an application on it that will automatically insert any such user identifiers and associated preferred names or identifiers (if any) provided to them by an alternative means into the predetermined user's connection data.

35 Preferably a predetermined user may be provided with the alternative user identifiers for any user comprised in the connection data.

Alternatively a predetermined user may be provided with the alternative user identifiers

associated with any given user identifier.

Preferably one or more alternative user identifiers provided to a predetermined user pursuant to the preceding paragraphs may be selected by the predetermined user for automatic insertion into the connection data in the predetermined user's network access device.

In a further aspect the invention may broadly be said to consist in a system for determining relationships between users of a networked system and determining the relationships by executing the method of any one or more of the preceding paragraphs.

In a further aspect the invention may broadly be said to consist in a computer system for determining relationships between users of a networked system and determining the relationships by executing the method of any one or more of the preceding paragraphs.

In a further aspect the invention may broadly be said to consist in software for determining relationships between users of a networked system and determining the relationships by executing the method of any one or more of the preceding paragraphs.

In a further aspect the invention may broadly be said to consist in storage media containing software as set forth in the preceding paragraph.

In a further aspect the invention may broadly be said to consist in apparatus for determining one or more relationships between a plurality of users of a networked system, the apparatus including:

a database populated with a unique user identifier for each of the plurality of users and with connection data for each such user,

a processor adapted to search the database for a predetermined user's unique user identifier to identify each user who has a connection to the predetermined user, and a memory to store the user identifiers located by the search to provide a group of stored user identifiers representative of one or more relationships between the predetermined user and one or more other users.

Typically the step of populating the database with connection data for each user will be

accomplished by accessing the connection data on the users' network access device.

Preferably users may specify that certain user identifiers within their connection data not be accessible to other users of the networked system or be included in any processing of data undertaken by the processor. User identifiers so specified are "Blacklisted".

Preferably a predetermined user may specify additional user identifiers that relate to the predetermined user to be associated with the predetermined user's unique user identifier. Such additional user identifiers may relate to the given networked system or to any other networked system. It is not necessary for the networked system to which a given additional user identifier relates to be interconnected with the given networked system.

Preferably the record of a predetermined user's connection data in the database will be kept synchronised with the connection data stored in the predetermined user's network access device such that any changes to the connection data stored in the predetermined users network access device, whether initiated through interaction with the present invention or independently by the predetermined user, will be communicated to the database ensuring that all processing of connection data undertaken by the present invention uses current and correct data.

Preferably the processor is adapted to perform the step of searching the database in respect of a predetermined user for each user in the database.

Preferably, the apparatus includes communication means to communicate the stored user identifiers to the predetermined user.

Preferably, the processor may compare the stored user identifiers with the connection data for the predetermined user, and the stored user identifiers which do not comprise part of the connection data for the predetermined user are communicated to the predetermined user.

Preferably, the processor may compare the stored user identifiers with the connection data for the predetermined user, and the stored user identifiers which do not comprise part of the connection data for the predetermined user may be selected by the predetermined user for automatic insertion into the connection data in the predetermined user's network access device.

Preferably, the processor may compare the stored user identifiers with the connection data for the predetermined user, and the connection data which do not comprise part of the stored user identifiers may be communicated to the predetermined user.

5 Alternatively, the processor may compare the stored user identifiers with the connection data for the predetermined user, and the connection data which do not comprise part of the stored user identifiers may be used by the communication means to contact users who appear in the connection data but not in the stored user identifiers to invite them to include the predetermined user's user identifier in their connection data.

10 Preferably the predetermined user may choose which if any of the users identified in the preceding paragraph are invited to include the predetermined user's user identifier in their connection data.

15 Preferably user's contacted in accordance with the preceding paragraph will have a network access device with an application present on it that will automatically insert the predetermined user's user identifier into the user's connection data.

20 Preferably, the processor may use the stored user identifiers to communicate to a predetermined user an indication of the user's popularity in the networked system.

25 Preferably, the processor may use the aggregate connection data of users of a given networked system to determine the popularity of users of an interconnected networked system with users of the given networked system. Such a determination may be provided to the operator of the given networked system or communicated to the users of the interconnected networked system.

30 Preferably, if the user identifier for the predetermined user should change, the processor may use the communications means and the stored user identifiers to contact users who have the predetermined user's user identifier, informing them of the change in the predetermined user's user identifier, providing them with the opportunity to update their record of the predetermined user's user identifier.

35 Alternatively, if the user identifier for the predetermined user should change, the processor may use the communications means and the stored user identifiers to send instructions to

the network access device of such users with the predetermined user's user identifier to the effect that such device's record of the predetermined user's user identifier is updated automatically.

5 Preferably, if a predetermined user permanently leaves the networked system for any reason the processor may use the communications means and the stored user identifiers to contact users who have the predetermined user's user identifier in their connection data, informing them that the predetermined user's user identifier is no longer active and providing them with the opportunity to remove the predetermined user's user identifier from their connection data.

10 Alternatively, if a predetermined user permanently leaves the networked system for any reason the processor may use the communications means and the stored user identifiers to send instructions to the network access device of users who have the predetermined user's user identifier in their connection data, to the effect that such devices record of the predetermined user's user identifier is deleted from their connection data.

15 Preferably during the step of populating the database for each user the processor will determine if any of the user identifiers in the predetermined user's connection data are no longer active and communicate such inactive user identifiers to the predetermined user, providing the predetermined user with the opportunity to remove such inactive user identifiers from their connection data.

20 Alternatively, during the step of populating the database for each user the processor will determine if any of the user identifiers in the predetermined user's connection data are no longer active and send instructions to the predetermined user's network access device to remove the inactive user identifier's from the predetermined user's connection data.

25 Typically users associate a name or identifier with each of the user identifiers that comprise the user's connection data.

30 Preferably users may associate a preferred name or identifier with their own user identifier.

35 Preferably the processor may compare the name or identifier associated with a predetermined user's user identifier in the connection data for each user comprised in the

stored user identifiers with the predetermined user's preferred name or identifier and use the communications means and stored user identifiers to invite any of the users comprised in the stored user identifiers that do not use the predetermined user's preferred name or identifier in their connection data to associate the predetermined user's preferred name or identifier with the predetermined user's user identifier in their connection data.

5 Preferably the predetermined user may choose which if any of the users identified in the preceding paragraph are invited to use the predetermined user's preferred name or identifier in their connection data.

10 Preferably users contacted in accordance with the two preceding paragraphs will have a network access device with an application present on it that will automatically change the name or identifier associated with the predetermined user's user identifier in the user's connection data to be the name or identifier preferred by the predetermined user.

15 Preferably a user may request that the preferred name or identifier for any user identifier present in the user's connection data be communicated to the user.

20 Preferably a user making a request in accordance with the preceding paragraph will have a network access device with an application present on it that will automatically change the name or identifier associated with a user identifier in the user's connection data to the preferred name or identifier communicated to the user.

25 Preferably, the database is further populated with one or more characteristics of each user. Characteristics may include the name and occupation of each user.

Preferably, the processor may search the database for one or more such characteristics to determine which users possess the characteristic or characteristics.

30 Alternatively, the processor may search the connection data of users in the database for a given user identifier to determine which users have a connection with the user associated with the given user identifier.

35 Preferably the processor may search a predetermined user's connection data for at least one of the characteristics.

Preferably the processor may search the connection data of each user comprised in the predetermined users connection data for at least one of the characteristics or for a given user identifier.

- 5 Preferably the results of any search for a given characteristic within a predetermined user's connection data or the results of any search for a given characteristic or a given user identifier within the connection data of each user comprised in the predetermined user's connection data may be communicated to the predetermined user.
- 10 Preferably the processor may search the stored user identifiers for the at least one characteristic.
- 15 Preferably the processor may search the connection data relating to each of the stored user identifiers for the at least one characteristic or for a given user identifier.
- 20 Preferably users of a networked system may assign themselves or agree to be assigned to one or more groups. Such groups may represent clubs, families, workplaces or any other logical grouping of users. The user identifier and other characteristics of each member of the group will be associated with each such group.
- 25 Preferably the processor may communicate the name and user identifier of each member of the group to the other members of the group. Such communication may be either automatic or upon the request of the group member. Such communication may occur either upon the formation of the group or at any subsequent time.
- 30 Alternatively, the name and user identifier of each member of the group will be communicated by the processor to the network access device of each member of the group such that each group member will be given the option of including each or all of the other group members name and user identities into their connection data, either manually or via the assistance of an application resident on the group member's network access device.

Alternatively, the name and user identifier of each member of the group will be communicated by the processor to the network access device of each member of the group such that the connection data for each group member is automatically updated to include the name and user identity of each of the other members of the group.

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Preferably the processor will communicate the user identifier and name of any member that joins or leaves the group to the other members of the group.

10 Alternatively, the name and user identifier of any member that joins or leaves the group may be communicated by the processor to the network access device of each member of the group such that each group member will be given the option of adding or removing the user identifier and name of each such group member to/from the predetermined user's connection data, either manually or via the assistance of an application resident on the group member's network access device.

15

Alternatively, the name and user identifier of each member that joins or leaves the group may be communicated by the processor to the network access device of each member of the group such that each group member's connection data is automatically updated to include/exclude the user identifier and name of each such joining/leaving group member.

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Preferably the processor will communicate any change in the user identifier of any member of the group to the other members of the group.

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Alternatively, the new user identifier of any group member may be communicated by the processor to the network access device of each group member such that each group member will be given the option to update the changed user identifier in the group member's connection data, either manually or via the assistance of an application resident on the group member's network access device.

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Alternatively the new user identifier of any group member may be communicated by the processor to the network access device of each group member such that each group member's connection data is automatically updated to include any changes to the user identifier of any other member of the group.

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Preferably the present invention may be interconnected with alternative means of obtaining user identifiers and associated preferred names or identifiers (if any).

Preferably a predetermined user may request that a user identifier and associated preferred name or identifier (if any) provided to them by an alternative means be communicated to the predetermined user's network access device.

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Preferably the predetermined user's network access device will have an application on it that will automatically insert any such user identifiers and associated preferred names or identifiers (if any) provided to them by an alternative means into the predetermined user's connection data.

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Preferably the alternative user identifiers for any user comprised in the connection data of a predetermined user may be communicated to a predetermined user.

Alternatively the alternative user identifiers associated with any given user identifier may

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Preferably one or more alternative user identifiers communicated to a predetermined user pursuant to the preceding paragraphs may be selected by the predetermined user for automatic insertion into the connection data in the predetermined user's network access device.

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In a further aspect the invention may broadly be said to consist in a computer executable method for determining one or more relationships between a plurality of users of a networked system, the method including the steps of:

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populating a database with a unique user identifier for each of the plurality of users, further populating the database with connection data for each such user, searching the database for a predetermined user's unique user identifier to identify each user who has a connection to the predetermined user, and storing the user identifiers located by the search to provide a group of stored user identifiers representative of one or more relationships between the predetermined user and one or more other users.

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Preferably the user identifier information includes a user identifier and one or more characteristics of users such as occupation.

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In a further aspect the invention may broadly be said to consist in a method for maintaining or creating one or more relationships between a plurality of users of a networked system, the method including the steps of searching connection data to determine which users have a predetermined user's user identifier in their connection data, and informing the predetermined user of the users located by the search.

5 Preferably the predetermined user may also be provided with a subset of the users located in the preceding search, being those users located by the search whose user identifiers are not present in the predetermined user's connection data.

10 Preferably the set of users located by the search can also be used to provide the predetermined user with a further subset of users, being those users in the predetermined user's connection data that are not also included in the set of users located by the search.

15 In a further aspect the invention may broadly be said to consist in a method for maintaining or creating one or more relationships between a plurality of users of a networked system, the method including the steps of providing a database populated with a unique user identifier for each of the plurality of users and with connection data for each such user, receiving any updated user identifier information and/or updated connection data, updating the database, and where applicable user's NADs with the new information.

20 Preferably the step of receiving the updated user identifier information and/or updated connection data includes receiving the information from a NAD.

25 Preferably the plurality of users may include a group of users, and updating information relating to a member of the group includes sending updated information to the other members of the group.

30 Preferably the method includes the step of inviting a user to establish a connection with a predetermined user or enabling a predetermined user to include another user's user identifier in the predetermined user's connection data.

35 In a further aspect the invention may broadly be said to consist in a method for maintaining or creating one or more relationships between a plurality of users of a networked system, the method including the steps of: for a predetermined user, searching the connection data of all user's included in the predetermined user's connection data and

the connection data of all user's that have the predetermined user's user identifier in their connection data relating to all users that have a connection to the predetermined user for a selected characteristic and storing user identifiers of users who have the selected characteristic.

5

Preferably the step of searching information relating to all users that have a connection to the predetermined user includes searching information relating to users who have a connection to the predetermined user via another user.

10 Preferably the selected characteristic may include a connection to another predetermined user or a trade, profession, skill, interest or locality.

15 In a further aspect the invention may broadly be said to consist in a method of determining a user value indication for a user of a networked system, the method comprising the steps of determining the connections for the user to determine a popularity indication for the user and providing the popularity indication to the user or to one or more other networked systems as a value indication of the user to the networked system.

20 In a further aspect the invention may broadly be said to consist in apparatus for executing the methods of the foregoing paragraphs.

25 In a further aspect the invention may broadly be said to consist in a back up system for a networked system, the back up system including a central repository of data relating to a plurality of users of the networked system, the repository including a unique identifier identifying each of the plurality of users and connection data for each of the plurality of users.

Definition

30 "Connection data" means data representative of one or more connections between uniquely identified users. Typically connection data will be stored on a predetermined user's network access device. By way of example the data may be obtained from, without limitation: an entry in a mobile telephone address book (for example, resident on a SIM card); an entry in a Microsoft Outlook™ Contact list; a Hotmail™ address book entry or a buddy/contact in the buddy/contact list of an instant messaging application such as ICQ, AOL Instant Messenger or MSN Messenger.

35 "Stored User Identifier" means data representative of one or more unique user identifiers

which is stored transiently or permanently in a memory, for example stored in RAM or stored on a suitable magnetically or optically readable medium.

"Network Access Device" or "NAD" means any device or other means used by users of a networked system to access the networked system.

5 "Blacklisted" refers to a user identifier in a predetermined user's connection data that has been specified by the predetermined user as not to be accessible to other users of the system or included in any processing undertaken by the system.
"Networked System" may include either a single networked system or a plurality of interconnected networked systems.

10 **Drawing Description**
A preferred embodiment of the invention will be described below by way of example with reference to the accompanying drawings in which:

15 Figure 1 is a schematic of one or more networked systems, illustrating how several networks may interconnect with each other and with the present invention;
Figure 2 is a schematic of a part of the system of figure 1, being the part which comprises the present invention;
Figure 3 is a series of tables illustrating possible examples of relationships between users of a system; and
20 Figure 4 is a diagram of a relationship determination process according to the invention.

Description of Preferred Embodiment

25 A plurality of networked systems comprising System A, System B, System C and any number of further additional systems, as represented by System X, are shown. Each of the networked systems is based around a particular network, so System A includes a network A, System B includes a network B etcetera. The systems may or may not possess a Repository/SDMS pursuant to the present invention. The systems may also be networked together at the network level such as is shown by network interconnection 2, for example, which would permit users of one network to communicate with users of another network. Further the systems may also be connected at the Repository/SDMS level pursuant to the present invention by means of either a direct connection between Repository/SDMS' (not shown) or an inter-operator exchange 5 or, for the purposes of back up and restore functionality, by means of an international gateway 3. A system that includes the Internet 4 is also shown.

35 In each of the systems, a number of individual entities, such as entities A, B and C of

System A, access the network A through a NAD (network access device). The entities may be individual persons or may be organisations of persons such as corporations for example. An entity could also comprise a machine.

5 Typically the network access device will comprise an electronic machine. For example, if network A is a wireless telephone network such as a GSM network, then each network access device will typically comprise a wireless telecommunication device such as a mobile telephone. Should network A comprise a wired telecommunication network then the network access devices will typically comprise network servers or personal computers
10 for example. A personal computer 5 is shown as the access device to access the Internet.

15 The present invention provides a data management repository. The data management repository will manage and process data held by subscribers of a given networked system or systems. It is possible that only one repository may be required. For example, networked systems A and X of Figure 1 can be served by the same data management repository A via network interconnection 2. Similarly, repository A could also service further interconnected systems (not shown). Other systems B and C each have their own repositories, being repository B and repository C respectively.

20 In the preferred embodiment of the invention, some or all of the individual repositories may be linked by an international gateway such as gateway 3, enabling user connection data to be backed up and restored to user's network access devices anywhere in the world by any network operator using the present invention and whose network is connected to the international gateway.
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30 Additionally, the operators of some repositories may wish to interconnect their repositories at a more fundamental level, either by means of an inter-operator exchange 5 that any operator may connect to, a private inter-operator exchange or by means of a direct link between repositories. Linking individual repositories or connecting with an inter-operator exchange will enable subscriber data to be passed between such otherwise separate networked system.

35 Turning now to Figure 2, more information is provided about the functions of the repository according to the invention. The repository is generally referenced 10 in Figure 2, and primarily consists of a computer system including a database 12 and system management

software 14. The management software includes user management, licensing, auditing, resilience, integration, security, configuration and international recovery applications.

Generally the management software ensures that users and subscribers of a system are only permitted access to such data as is appropriate, to ensure that the repository is highly available, to manage the functionality available to the licensee of the system, to manage the number of users/subscribers that may use the system, to track activities undertaken within the system etc. The database 12 may be a single database or distributed across several databases, which database(s) may be present on a single or several physical machines.

The data that is stored in the core repository relates to relationships between users of the networked systems that are served by the repository. The relationship data is most easily explained with reference to Figure 3. Each entity or user of the network will typically know one or more other users of the network i.e. will have a connection with one or more other users, and the NAD used by that entity will typically store data relating to those connections along with one or more system addresses or similar identifiers for those known users. One example of such connection data which may be stored in an NAD is the telephone number data which may be stored on the either on SIM card of a mobile telephone or in the mobile telephone itself. Another example is the list of contact data which may be held in the "contacts" of a user in Microsoft Outlook™. This data is referred to in this document generally as "connection data" for the user of the NAD.

The connection data stored on NADs may be narrower in scope than that stored in the repository. The connection data stored in the repository may be supplemented by additional information to further facilitate the creation, determination and maintenance of relationships between users. For example, groups that users belong to (clubs, family groups, workplaces etc) may be recorded within the repository, along with information on users' locations, users' interests and professions etc.

Multiple user identifiers for each user may also be stored. Storing such supplemental data enables the provision of additional services such as group type services where each member of the group is kept current on the contact information of all other group members or search the connection data of users to which a predetermined user has a connection to see if any such users know anyone or any organisation of a particular type. Storing additional user identifiers for users also enables the determination, creation and maintenance of relationships between users not just across different networks but also

across different types of networks.

Storing additional user identifiers also enables users that have a predetermined user's user identifier to request the predetermined user's alternative user identifiers. This would be of use where a user has the mobile number of a predetermined user but would actually like, for example, to send a fax to the predetermined user. In this case the user could select the known user identifier and request the system to send any other available user identifiers for the predetermined user to the user. If the predetermined user had included their fax number in the profile within the SDMS at some point then this number would be presented to the user enabling the user to send the predetermined user a fax. Such an example can similarly be applied to any networked system such as an email system, public switched telephone network, postal network or otherwise.

User's that store alternative user identifiers for themselves within the SDMS will have the opportunity to flag some or all of those alternative user identifiers as not being available to requestors of alternative user identifier information. This would allow, for example, a predetermined user to store their home telephone number within the SDMS so that they can utilise name and number invitations, number updates and other such features of the present invention that relate to users that may already have the predetermined user's home number without making that number available to any person that has one of the predetermined user's user identifiers.

The system can communicate with network administration databases 13 and 15. For example, database 13 may comprise a provider billing database and database 15 may comprise a customer service database for a mobile telephone network. Therefore, changes to user details recorded on the customer service database may be immediately uploaded to the core repository so that customer's records may be kept current. Similarly, services provided to network users by the system can be billed to the network provider, or to network users directly.

Turning to Figure 3, a diagrammatic example of the data stored in core repository 12 is illustrated. The names of four possible users, being Andrew, Bill, Ingrid and Alex, are set forth with the contact details of other users known to each of Andrew, Bill, Ingrid and Alex provided in tabular form beneath their names. Thus, for example, Andrew has a mobile telephone in which he has stored three contacts, being Bill, Christine and David. Bill has a mobile telephone in which he has stored details of three of his contacts. In this case

each such contact's telephone number would be their unique identifier. All of the contacts may belong to the same networked system (ie: the same telephone network) or to other interconnected networked systems (ie: different telephone networks).

5 Ingrid has an Internet email connection, provided on a personal digital assistant for example, and has stored details of the email addresses of Andrew, David, Christine and Bill.

10 This information, for each of these users, is provided to the central repository 12. This may be achieved in a variety of ways. In the example of a mobile telephone the user has the option of transmitting the information wirelessly using the telephone. Therefore, the information may be transmitted from the mobile client 20 (Figure 2) via a short message service centre 22 (or any communications medium supported by the particular NAD and networked system) to the core repository 12.

15 Alternatively, in the particular case of a GSM mobile network, the data may be downloaded from a SIM card using a reader 24 provided at a predetermined location such as a mobile phone retail outlet or similar centre 26. As another alternative, the information from the SIM card may be downloaded from a stand-alone booth or similar facility provided in a shopping centre, for example, such as a mall 28.

20 With the data relating to Ingrid, this information may be downloaded from Ingrid's personal digital assistant by being sent wirelessly by Ingrid, or by being sent over a standard telephone network through a modem connection, for example. Alternatively, if Ingrid's contacts are provided on a server, such as a Hotmail server for example, then the information may be downloaded directly from that server by the system.

25 Once the information has been obtained, the next step is to assign a unique user identifier to each of the users so that that particular user is identified and the user's system contact address(es) is associated with the identifier.

30 In most cases it is likely, but not required, that the unique user identifier for a particular user will simply be their contact address in the networked system within which the SDMS is located. Where users of a networked system have several contact addresses within the networked system or contact addresses in other networked systems that are interconnected with the networked system within which the SDMS is located then it is also

likely, but not required, that one of the contact addresses from within the networked system within which the SDMS is located will be chosen as the unique user identifier. Alternatively the operator of the SDMS may elect to generate unique user identifiers that are unique to the SDMS itself. Any contact address for a given user that is not used as a unique user identifier for that user will be associated with that user's unique user identifier.

Once the Identifiers have been assigned, then the data remains in the repository. The connection data stored in the repository and in the NAD are kept synchronised. Typically synchronisation between the connection data stored on the NAD and the repository will be maintained by an application present on the NAD communicating any changes to the connection data stored on the NAD to the repository and the repository communicating any changes to the connection data stored repository to the NAD. Other schemes for maintaining synchronisation exist and may be used. In the case where the NAD is not capable of running an application then full synchronisation will be intermittent with the user of the NAD receiving notification from the repository of changes to the connection data stored in the repository and the user then manually entering such changes into the connection data stored in the NAD. In the case where the NAD is not capable of running an application then any changes to the connection data on the NAD will not be synchronised with the connection data in the repository until the user directly connects the NAD to the repository or to a system designed to directly connect the NAD to the repository.

Assuming that Bill and Andrew belong to the same networked system (a mobile telephone network), their data will be stored in the same SDMS. If Bill and Andrew belong to different networked systems (ie: different mobile networks) then several alternate configurations are possible, their information may for example be stored in two separate unlinked SDMS', their information may be stored in two separate but linked SDMS' or the operator of one network may operate an SDMS and permit users from the other operator to store data in the first operator's SDMS. Where SDMS' are linked they may be considered as a single SDMS for the purposes of the functioning of the present invention.

Ingrid's data may also be stored in the same SDMS as Bill and Andrew, but it may also be stored in a separate SDMS within the networked system to which she belongs (an email network). If Ingrid's data is stored in a separate SDMS that is linked to the SDMS storing Bill and Andrew's data then Bill and Andrew will also need to have included in their data their contact address in the network to which Ingrid belongs in order for Ingrid's data to be

matched with the correct entities.

Typically when user's connection data is first entered into the SDMS the SDMS will search the connection data for any user identifiers that are no longer active within the networked system or any interlinked networked system. User's will be given the opportunity to manually remove any such inactive user identifiers or where the user's network access device is running an application then the application may automatically delete any such inactive user identifiers that the user agrees should be removed.

Having obtained the raw relationship data, the invention allows the data to be used to determine the relationships between users. One application of the invention is shown in Figure 4. In this case, Bill may wish to determine who in the SDMS has his contact addresses in their connection data.

The first step is to perform a search for one or more of a pre-selected user's contact addresses in the connection data of the other users in the SDMS. In the case of the connection data provided in the example of Figure 3, the method involves performing a search for a particular user to see who has that user's system contact address(es) in their connection data. Therefore, in step 30 of Figure 4, a search of the data in the database is performed to see who has Bill's system contact address(es).

In the case where Andrew and Bill are in the same SDMS (or in interlinked SDMS') and the search is for people that know Bill's telephone number then the result returned will be "Andrew". Alternatively, if the search on Bill's email address and we assume that Andrew, Bill and Ingrid are all in the same SDMS (or in interlinked SDMS') then the result returned will be "Ingrid". Alternatively, if the search was on both of Bill's contact addresses (ie: telephone number and email address) and we assume that Andrew, Bill and Ingrid are all in the same SDMS (or in interlinked SDMS') then the result returned will be both "Andrew" and "Ingrid" and a means of distinguishing which contact address each held.

The result shown in step 32 is that Andrew and Ingrid both have Bill as a contact. In step 34 the result is stored. At this point it can be seen that these steps may be repeated for each system user on the database so that the database can be appropriately indexed, or a separate database can be maintained, where the relationships between users are clearly set forth, i.e. there is a record for Andrew which indicates each of Andrew's contacts and there is also a list of those who have Andrew as a contact.

Continuing with Figure 4, the information in relation to those who have Bill as a contact may be provided to Bill, for example being sent by SMS message to Bill's mobile telephone, in step 36 for his information.

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When user's connection data is first entered into the SDMS they are able to "Black list" particular user identifiers present in their connection data. User identifiers that have been "Black listed" are not accessible to other users of the system or included in any processing undertaken by the SDMS. Referring to the preceding example, if Andrew had "Black listed" Bill's user identifier in his connection data when it was entered into the SDMS then the result shown in step 32 would be that only Ingrid has Bill as a contact, the fact that Andrew also has Bill's user identifier in his connection data would be ignored by the SDMS. The behaviour of the SDMS specified above in respect of "Black listed" user identifiers applies in respect of all other SDMS services involving user interaction, including for example, the generation of name and number updates, number invitations, dead link removal etc.

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Users may also "Black list" user identifiers in their connection data at any time after their connection data is first entered into the SDMS.

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Using a further application of the invention Bill can then use this information to ask those individuals in his contact address book who do not themselves have his number whether they would like to receive it. This process is preferably performed as part of the core repository software application and is shown in step 38 where a comparison is performed between the contacts in Bill's address book and the stored result from step 34. The outcome is set forth in step 40 which shows that "David" and "Fred" either do not have Bill's number in their connection data or that their connection data is not stored in the SDMS. The next step 42 is to enable Bill to issue invitations to "David" and "Fred" asking them if they would like Bill's number. Such invitations would be issued by any means of communication supported by both Bill and the recipients of the invitation. In a mobile telecommunications network for example such invitations may be issued by way of an SMS message. Where an invitee is connected to an SDMS then it may have an application operating on the NAD that intercepts such invitations, presents the invitation on the NAD graphical display and automatically inserts Bill's number into their address book for them. Where invitee's are not connected to an SDMS then the invitation may simply be displayed on the invitee's screen and the invitee would be required to manually

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enter Bill's information into the connection data on their network access device. In the case where the invitee is not a person then whether or not such invitations are accepted would depend on the rules for acceptance programmed into the invitee.

- 5 Using a further application of the invention Bill can then use this information to determine if there are any people that have his contact address in their contact address book but for which he does not have their contact address in his own contact address book. This process is preferably performed as part of the core repository software application and may also be shown in step 38 where a comparison is performed between the contacts in
10 Bill's address book and the stored result from step 34. The result is set forth in 44 showing that Alex is a person who has Bill's number but Bill does not have his. The next step 46 is to provide Bill with the opportunity to store Alex's contact address, provided Bill's NAD was configured to receive that form of contact address.
- 15 The system may also provide a list to a user of those other users who have that user's contact details on demand. Also, as described above, the system may send contact invitations to individuals who do not have the contact of another user who has their contact.
- 20 Knowing the relationships between users, the system can also provide further useful functionality by providing a contact update service. Therefore, referring again to Figure 3, if Andrew's contact address on the system should change, Andrew can request that the system advise this fact to those other users who have Andrew as a contact. Alternatively the system may be automatically configured to advise others with Andrew's contact address of any changes. The SDMS may be configured to advise anyone with any of Andrew's contact addresses of any change in any such address or to just advise those that have the particular contact address that has changed of the change. Therefore, in the event that Andrew's telephone number changed and the SDMS was configured to only advise holders of that contact address of changes, Bill would receive a message advising
25 him that Andrew's number had changed and prompting him to accept the new number which may be provided with the message. Alternatively, if Andrew's email address changed and the SDMS was configured to only advise holders of that contact address of changes, then Ingrid would receive a message from the system advising her that Andrew's email address had changed and prompting her to accept the new email address which may be provided with the message. If the SDMS was configured to advise every
30 person that held any of Andrews contact addresses of any changes then both Bill and
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Ingrid would receive messages. Since the database has recorded the relationships between the individuals, this can be achieved relatively easily.

A further function provided by the system allows users to specify a preferred name or identifier to be associated with their user identifier in other user's connection data. In figure 3 for example Bill may wish that other users of the networked system associate the name "Bill Smith" with his user identifier. Having specified his preferred name Bill could then request the system to compare his preferred name to the name or identifier associated with his user identifier in other user's connection data and issue a name invitation to those users that do not currently use "Bill Smith" in association with Bill's user identifier. Typically a user will be able to choose which user's that are not currently using the user's preferred name actually receive a name invitation. In the present example both Alex and Andrew are not using Bill's preferred name and so Bill could request that name invitation be sent to either or both of them asking if they would like to change the name associated with Bill's user identifier in their connection data from "Bill" to "Bill Smith". This functionality will have particular application to situations where a user changes their name, such as where a woman may change her name after getting married or where a company name is changed after a buy-out or merger. This functionality may also be useful where a user would prefer to be known by a particular nickname.

Upon receiving a name invitation Alex and/or Andrew could either ignore the invitation, manually update their connection data or in the case where one or both of them have an application present on their network access device, agree to the change and have the application automatically modify the name associated with Bill's user identifier in their connection data.

Additionally, having user's preferred names or identifiers stored in the SDMS would allow users with a predetermined user's user identifier to request the predetermined user's preferred name. This would be of use for example where a user only has part of the predetermined user's name or where the predetermined user's name is difficult to spell.

The system also allows contact detail recovery. For example, should a mobile telephone user lose his or her telephone, a replacement phone may be obtained and the SIM card for the replacement phone can be downloaded with the contact data, i.e. the old telephone address book directly from the system data repository. User's connection data will be available to users for recovery purposes from the operator of the networked system to

which they belong and also from the operator of any networked system that has a Repository/SDMS according to the present invention, which Repository/SDMS is connected to the Repository/SDMS to which the user belongs, whether by direct link between the Repository/SDMS', by connection to an inter-operator exchange or by connection to the international gateway. By way of example, should the user in the preceding example belong to a GSM mobile telephone network in Australia and the user loses their phone in the United Kingdom, then the user could purchase a new mobile phone from a GSM mobile operator in the United Kingdom and, provided the UK GSM mobile operator operated a Repository/SDMS according to the present invention which was connected to the Repository/SDMS of the networked system to which the user belonged in Australia, then the UK GSM mobile operator could access the users connection data and restore it to a new SIM card for the user.

Another function provided by the system is the provision of a popularity indication to those who are interested. Using the data stored on the data repository, a search may be implemented to see how many other users have any particular user's contact address. Also, an overall ranking may be achieved amongst all the users of the system so that a user can determine how popular he or she is. This information will be of particular interest to certain demographics within an operator's customer base, such as teenage subscribers. Such information will also be of interest to operators themselves as presumably popular individuals are more influential than less popular individuals and so may be more particularly targeted for marketing purposes. Further, it is likely that if being popular is perceived as desirable then individuals will seek to make their contact addresses more widely known which in turn is likely to increase the frequency of contact between individuals which in networks that charge on the basis of usage is likely to result in additional revenue to the operator.

An additional function provided by the system is the ability for the operator of a given networked system to determine the popularity of users of other networked systems interconnected with the given networked system with the users of a given networked system. It is often the case that the operator of a given networked system will have to pay the operators of interconnected networked systems for communications between users of each networked system where such communication is initiated by a user of the given networked system (eg: in the case of a mobile telecommunications network, a call from the user of one mobile telephone network to a user of a different mobile telephone network). It may be assumed that if a user of another network is popular with the users of

a given network then users of the given network will call the popular user more frequently than would otherwise be the case. In this case the operator of the given networked system may be paying considerable charges to operator of the other network, which charges could be avoided if such popular users could be identified and induced to change to the given networked system.

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A further service relates to common contacts amongst users. Therefore, the relationship data may be searched to determine those users who have contacts in common. For example, with reference to Figure 3, both Bill and Ingrid have Andrew and David as common contacts.

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More usefully perhaps, the connection data also allows indirect user relationships to be determined. For example, referring again to figure 3 we see that Ingrid has contact addresses for Andrew and Bill in her connection data. We can look to Andrew and Bill's connection data and see that Ingrid has indirect connections to Andrew and Bill's contacts i.e. to Christine, David and Fred. Further indirect connections may also be established. This can provide particular advantages in terms of locating people with particular skills or attributes. People always require the services or skills of others from time to time but there is often difficulty in finding an appropriate person, particularly when the service is one which has not been required in the past, or is one that a user has been previously unhappy with. Therefore many people try to seek a recommendation or at least a suggestion from other people before employing the services of a particular individual. For example, in the case of a plumber, a user may not have required the services of a plumber previously and may not know anyone in his or her immediate circle who is qualified as a plumber. Therefore, the individual who requires the plumbing service may wish to make enquiries of friends or other acquaintances to have them suggest an appropriately qualified person.

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With the present system, the connection data between individuals that it has captured includes, where possible, other information about the person such as their occupation. Therefore, the system allows the problem set out above to be solved. This can be done by searching the connection data of all the contacts of one individual to determine whether any of a person's contacts themselves knows an appropriately qualified person. Therefore, referring to Figure 3, if Andrew is seeking the services of a plumber and Andrew knows that Bill, Christine and David are not appropriately qualified, then Andrew may ask the system to determine if any of his contacts (ie: Bill, Christine and David in the

present example) knows a plumber. The system would then search the connection data of each of Andrew's contacts (to the extent that such connection data is stored within the system) to see if any of them know an appropriately qualified person. If they do, then the system can provide Andrew with the appropriate contact details, so that Andrew can contact those people. For example, the information supplied by the system may indicate that Fred is a plumber and that Fred is a contact of Bill's. In this way Andrew can contact Bill and ask Bill about Fred's services as a plumber. In this way, assuming Fred is likely to be an appropriate person, Bill can recommend Fred to Andrew.

10 In a further application of the present system, indirect connections can be sought not only for individuals with particular skills (as described above) but also for particular individuals themselves. Referring again to Figure 3, it may be that Andrew has determined that he would like to contact Fred for business purposes. While Andrew may contact Fred directly, Andrew may first want to find out a little more about Fred's reputation in the business community and also look for an introduction from a mutual contact that would increase the likelihood of Andrew's approach being well received by Fred. The present system enables this problem to be solved. This can be done by searching the connection data of all of Andrew's contacts to see if any of them has Fred's contact address. If any do then it can be presumed that they know Fred and would be able to tell Andrew a little

15 more about Fred and if appropriate arrange for a meeting or otherwise provide and introduction of Andrew to Fred. In the present example it can be seen that Andrew's search would be successful and that the system would advise him that Bill has Fred's contact details in his address book.

20 25 A further service relates to the formation of groups by users. Users of a networked system may assign themselves or agree to be assigned to one or more groups. Such groups may represent clubs, families, workplaces or any other logical grouping of users.

Upon its formation or subsequently a group may be configured to operate under certain rules such as which members are permitted to invite others to join the group, who is required to approve new members etc.

30 35 Referring again to figure 3, Andrew, Bill and Alex may belong to a chess club and wish to form a group within the system. Andrew takes the initiative and uses his network access device or other communications means to instruct the system to form a group, with the unique name say "ABA33". As the founder of the group Andrew is automatically a

member. Andrew has Bill's user identifier in his connection data and so can invite him to join the group. Alternatively Andrew could manually enter Bill's user identifier into the system in order to generate an invitation. Bill would then receive a message on his network access device inviting him to join group ABA33 and requesting that he respond.

5 Should Bill respond affirmatively then his details will be added to group. Upon joining the group the system will compare Bill's connection data with the user identifiers for the members of group ABA33 and if there are any group members that are not also included in Bill's connection data the system will generate a number invitation to Bill asking if he would like such members details added to his connection data (in the manner previously discussed). In the present case the only members of group ABA33 are Andrew and Bill and Bill already has Andrew's user identifier in his connection data so the system will not issue any number invitation's to Bill.

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Alex may wish to join the group, and not having already been invited, may use his network access device or other communications means to contact the system and request to join the group. Alex's request may be routed to Andrew (as the group's founder) or to other members of the group depending on how the group was set up. If the members responsible for approving new members approve Alex's request to join the group then Alex's user identifier will be added to the group and the system will compare Alex's connection data with the user identifiers for the members of group ABA33. In the present case it will be seen that Alex already has Bill's user identifier in his connection data but does not have Andrews. Accordingly the system will generate a number invitation asking whether or not Alex would like to have Andrew's user identifier added to his connection data and if Alex responds affirmatively then Andrew's user identifier will be inserted into the connection data on Alex's network access device. Further, since a new member has joined group ABA33 the system will also search the connection data of existing group members to determine if they have Alex's user identifier. In the present example neither Andrew or Bill have Alex's connection data and so both will receive number invitations asking whether or not they would like to have Alex's number inserted into their connection data.

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Continuing with the example of group ABA33, it may be that at some later stage Bill changes his user identifier within the networked system. This may occur under numerous circumstances, such as where a user upgrades a service provider plan pursuant to which they access the network. In the present example, the system would notify all those that have a connection with Bill of the change in Bill's user identifier (in the manner previously

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discussed), including those that obtained Bill's user identifier via their membership of the group.

In due course additional members may join group ABA33 and eventually members may also wish to leave the group. If Bill decides to leave the group then he may use his network access device or other communications means to contact the system and request that he be removed from the group. In response to this request the system would generate a removal notice to each member of the group that has Bill's user identifier in their connection data notifying them of Bill's removal from the group and asking if the member would like Bill's user identifier removed from their connection data. During his time with the group Bill may have formed relationships that extend beyond the immediate business of the group and so upon his removal from the group those with which he has formed a relationship, such as Alex for example, may decline to have Bill's user identifier removed from their connection data while others in the group, such as Andrew for example, with whom Bill is unlikely to have ongoing contact outside the context of the group, may agree to the removal of Bill's user identifier from their connection data. Correspondingly, upon Bill's withdrawal from the group the system will ask Bill if he would like to remove some or all of the remaining group member's user identifiers from his connection data.

In a further application of the present system, if a user leaves the networked system for any reason the operator of that system may remove their user identifier from the connection data of other users of the networked system. Referring again to figure 3, if subsequent to leaving group ABA33 Bill was to leave the networked system then a removal notification would be generated and sent to each user in the networked system with Bill's user identifier in their connection data. As noted in the preceding paragraph, Alex declined to remove Bill from his connection data when Bill left group ABA33 so Bill's user identifier would still be in Alex's connection data and accordingly Alex would be one of the users that receive a removal notice. If Alex has an application on his network access device then he will be asked if he would like Bill's user identifier removed from his connection data and if he agrees then Bill's user identifier will be removed automatically. If Alex does not have an application operating on their network access device then he will be able to read the notification and remove Bill's user identifier from his connection data manually.

In the case where a predetermined user has left the given networked system and moved

to a different networked system that has an SDMS interlinked with the SDMS of the given networked system (either directly or through an inter-operator exchange) then it may be that a removal notification (as specified in the preceding paragraph) is not issued by the SDMS of the given networked system as the SDMS of the new networked system may instead issue a change in user identifier notification to all users in both networked system that have the predetermined user's user identifier in their connection data. Continuing with the example in the preceding paragraph, if at the same time as leaving the networked system Bill also moved to an interlinked networked system, then upon joining the interlinked networked system a notification would be generated and sent to all users of both networked systems by the SDMS in the interlinked networked system informing such users of Bill's new user identifier and providing them with the opportunity to update their record of Bill's user identifier in their connection data. In the example of the preceding paragraph, Alex would be one of the user's receiving a notification of Bill's new user identifier.

The present invention may also be interconnected with alternative means of obtaining user identifiers. Examples of such alternative means include telephone directory services that a user can call for another user's telephone number and similarly equivalent Internet based directory services. An additional example could also be any web page with a user identifier on it which web page has a link to the SDMS on it. In addition to providing a user with a predetermined user's user identifier such alternative means may also provide the user with the option of adding the predetermined user's user identifier to the user's connection data. For example if a new user, Tom, required Alex's telephone number then Tom may call his phone companies directory service. Typically the calling parties telephone number is passed to the directory service and so once the directory service provides Tom with Alex's number it may also give Tom the option adding Alex's number directly to his connection data. This option will be available where Tom's phone number is passed to the directory service as part of the ordinary operation of a telephone network provided the directory service is linked with an SDMS and Tom has subscribed to the services of that SDMS or of an SDMS interconnected with that SDMS. If Tom accepts the option of having Alex's user identifier added to his connection data then the directory service will communicate Tom's phone number and the Alex's user identifier to the SDMS which will then communicate the information to Tom's network access device.

Generally, data from alternative means of obtaining user identifiers will be able to be added to users' connection data whenever there is a means of uniquely identifying the

user making the enquiry of the alternative means and there is a direct or indirect link between the alternative means and an SDMS to which the enquiring user belongs.

5 In summary, the invention advantageously allows relationships between users of a networked system to be determined, created and maintained. This facilitates personal and business relationships and increases appropriate use of the network.

10 Where in the foregoing description reference has been made to specific components or integers of the invention having known equivalents then such equivalents are herein incorporated as if individually set forth.

(Although this invention has been described by way of example and with reference to possible embodiments thereof, it is to be understood that modifications or improvements may be made thereto without departing from the scope of the invention.

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SIMWORKS INTERNATIONAL LIMITED

20 By its Attorneys

BALDWIN SHELSTON WATERS



Intellectual Property
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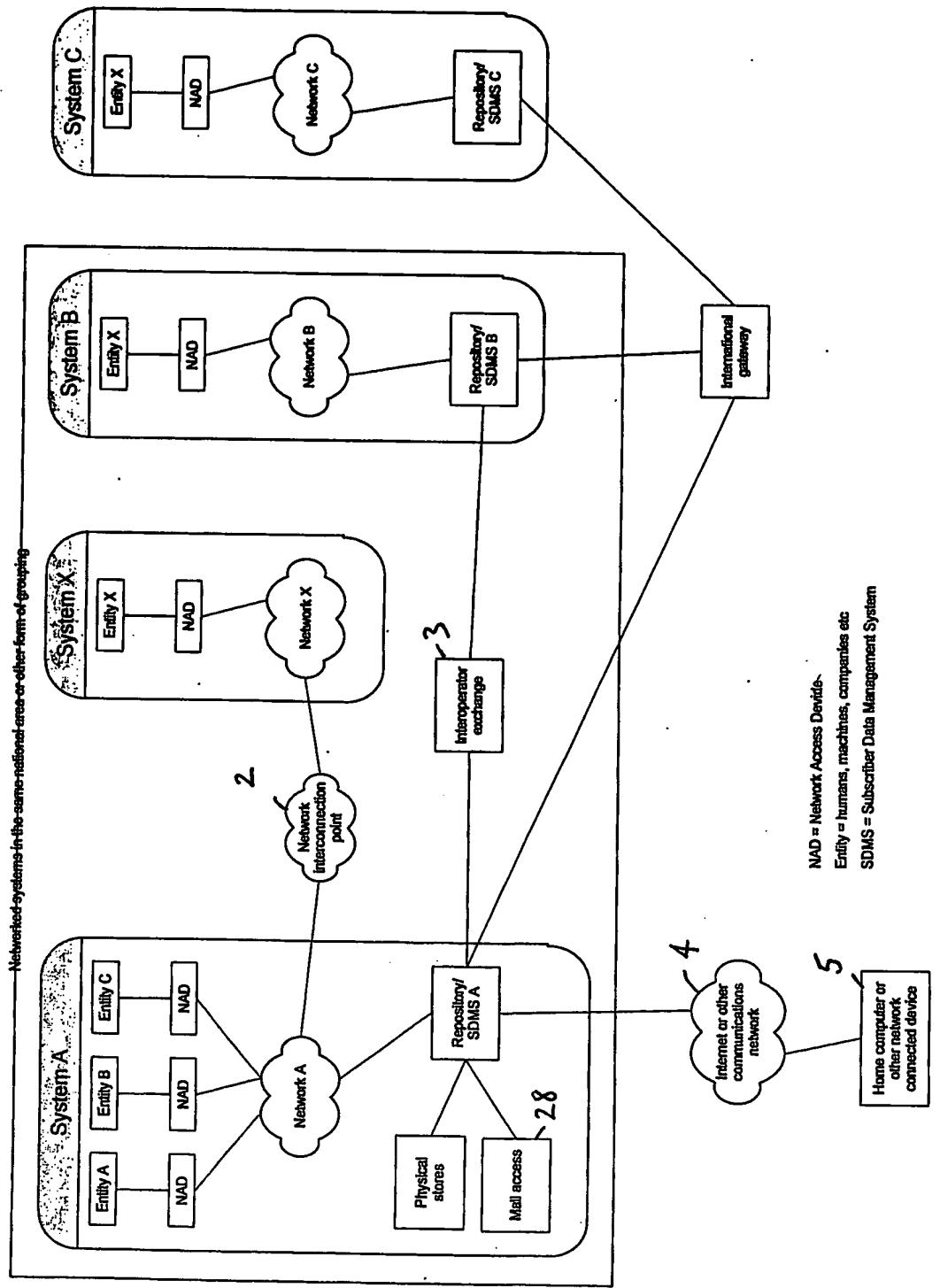


Figure 1 - schematic of networked systems

Figure 2 - composition of subscriber data management system

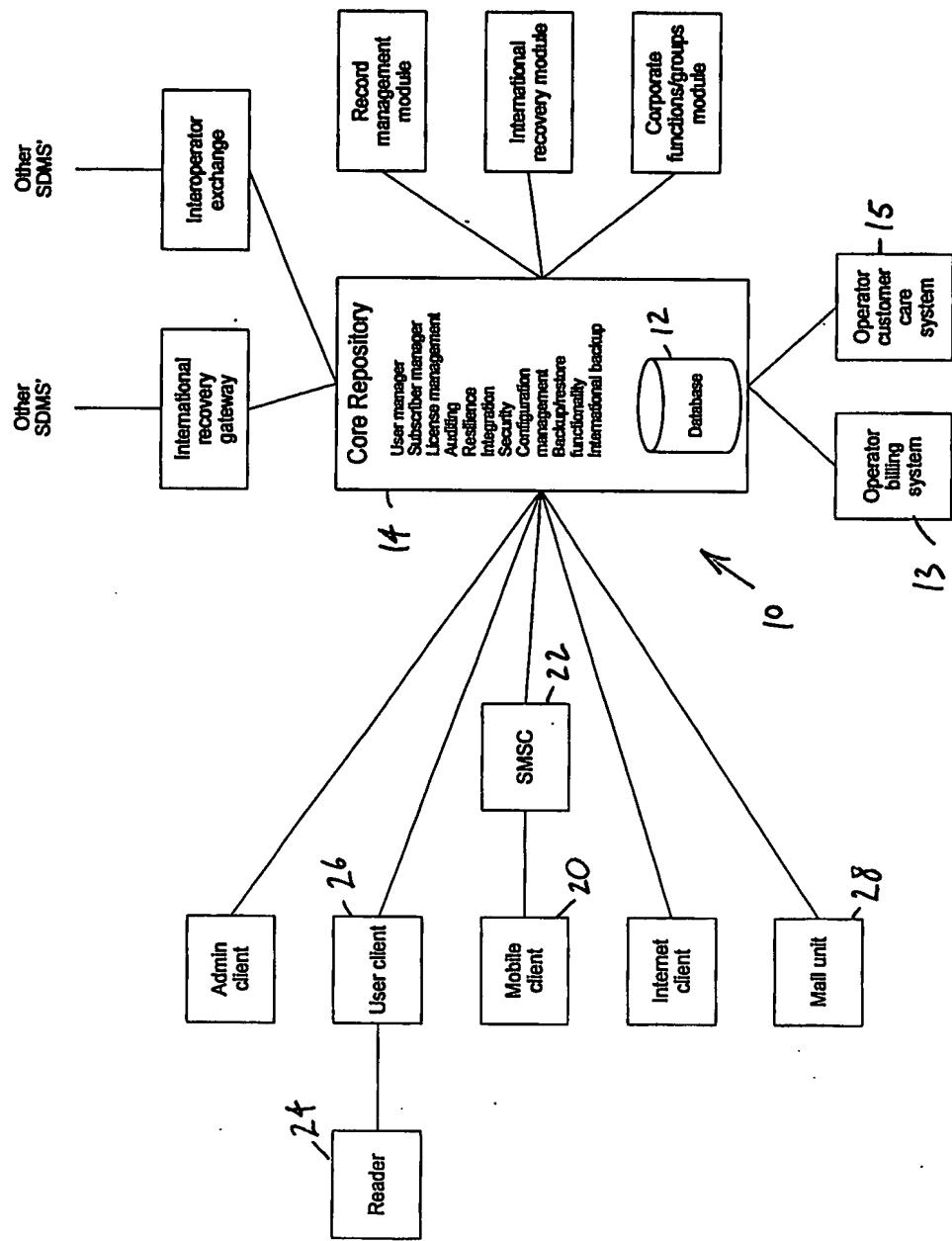


Figure 3 - Illustration of the relationships between users of a networked system

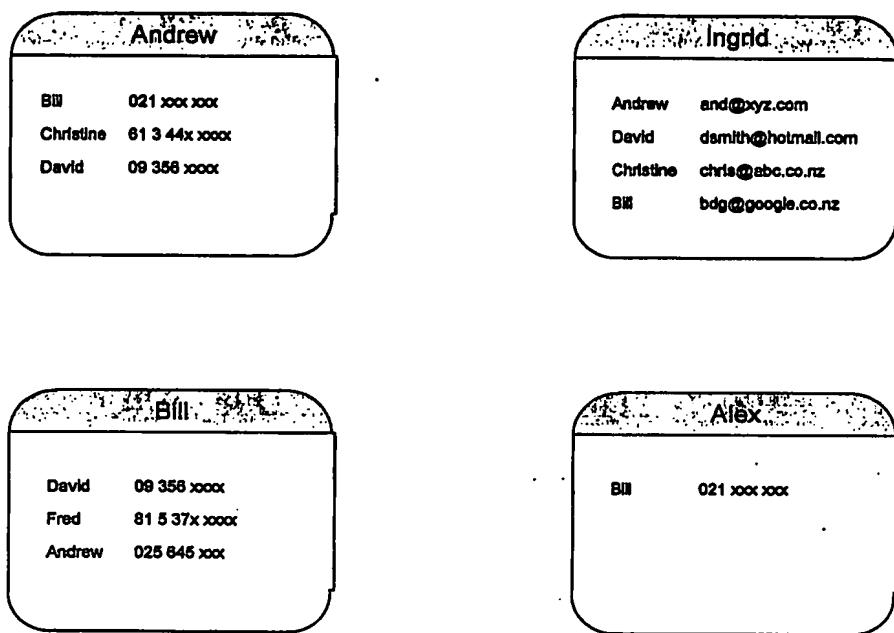


Figure 4 - Illustration of relationship determination process